Agence spatiale canadienne | Canadian Space Agency

Canada

Earth Observation Express

Other Editions

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1. Enhancing Agriculture and Agri-Food Canada (AAFC) Operational Decision Support for Crops, Drought and Agricultural Water Management with Earth Observation

Extreme weather along with climate change induced natural disasters is a major concern to all of Canada, particularly to the Canadian Prairies, and each year at least some part of the country is impacted. To monitor drought, crop condition and soil moisture provides crucial information for adaptation and mitigation programs. Agricultural applications, modeling and decision making often require multidisciplinary knowledge and data. One of the key data and information sources is value added near real time optical and microwave Earth Observation (EO) data. At regional and national scale, high and medium resolution microwave and optical satellites EO information offers the unique opportunity to derive many surface parameters over a range of temporal and spatial scales. Through the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), the AAFC led project team has studied and prototyped new EO data processing procedures, modeling and integration approaches, and data delivery web services. The value added EO data from sensors like ENVISAT/MERIS and RADARSAT-2 are integrated in agriculture related models such as productivity efficiency model (PEM) and Ecological Assimilation of Land and Climate Observations (EALCO). GRIP has enhanced the EO research, development and implementation capacity in the AAFC. This will further improve agricultural decision making, increase the ability to manage extreme events (e.g. drought, flood), and strengthen the EO HR capabilities in AAFC. This AAFC and CSA-GRIP project has been done in partnership with NRCAN-CCRS and Carleton University. For more information, please contact Xiaoyuan Geng or Guy Aube.

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2. A New Federal Approach to Purchasing and Managing Satellite Imagery

Imagery from Earth Observation (EO) satellites contributes to our understanding of issues such as climate change and underpins new EO applications that bring convenience to our lives and make our economy more competitive. The Government of Canada is improving the way it accesses and

manages commercial EO satellite imagery, which, together with imagery from government satellites, facilitates federal operations and decision making. On March 1, 2010, at an Ottawa workshop organized by Natural Resources Canada's Canada Centre for Remote Sensing, a suite of 15 new National Master Standing Offers was presented. The NMSOs simplify government purchasing of commercial imagery. Their terms allow government-wide imagery sharing, as well as release of lower-resolution imagery to the public for non-commercial use. The workshop also featured the federal system for delivering, archiving and cataloguing imagery. This system already manages the government's RADARSAT-1 and -2 imagery and will henceforth manage imagery purchased via the NMSOs. The assembled federal officials heard presentations from the companies supplying through the NMSOs and left with the information needed to purchase, share and manage EO assets in a way that sets a new standard.

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3. Assessing Natural Hazards in Thompson Canyon, British Columbia, with RADARSAT-2

Canada must translate knowledge into commercial applications that generate wealth for Canadians and support the quality of life we all want in order to create an entrepreneurial advantage. Firms large and small are bringing innovations into our lives, whether in the form of new technologies to address environmental problems or to ensure the safety and security of Canadians. Through the Canadian Space Agency's (CSA) Earth Observation Application Development Program (EOADP), TRE Canada has developed new Earth Observation techniques and methods based on RADARSAT-2 information to assess landslide movements along a 50 km stretch of the Thompson Canyon (British Columbia, Canada), a vital rail corridor threatened by many active landslides. The project is titled "Measurement of Horizontal and Vertical Motion using PSInSAR (TM). Multiple results derived from RADARSAT-2 that may benefit Canadian railways in assessing natural hazards were presented to the 7th Railway Ground Hazard Research Program Workshop organized annually by Transport Canada, the Canadian Pacific and Canadian National Railway companies. For more information, please contact Lyse Champagne.

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4. Disaster Management and Earth Observation Prediction Tools: Risk Estimate of the Propagation of Mosquitoes (Aedes aegypti) Spreading the Dengue Fever in Haiti

An earthquake of magnitude 7,3 on the Richter scale occurred in Haiti on January 12th, 2010 at 16:53 hrs, local time. In the aftermath, many buildings and houses, potential shelters for the population, either collapsed or were greatly damaged. With the rainy season approaching soon, the risk of the spread of water-borne diseases is likely to increase, notably with the hatch of mosquito larvae. Dengue fever, a potentially deadly viral infection, is transmitted to humans by mosquitos (Aedes anegypti), whose larvae grow mainly in stagnant waters and expand in urban and semi-urban areas. An image captured on January 20th, 2010, by Canadian satellite RADARSAT-2 combined to an image from Landsat-7 (2005) satellite, provides a mapping of those areas at risk of the potential spread of dengue fever. Based on these satellite images, a map of those areas most at risk are clearly identified in red. These predictions are made based on the analysis of information gathered from the two satellite

images which includes data such as topography, slopes, areas of stagnant water, river beds, and land use. This map of potential risk areas could be used by humanitarian organizations who are working on the ground. This disaster management products were developed by the Canadian company VIASAT GeoTechnologies, with the support of the Canadian Space Agency (CSA) Earth Observation Applications and Utilizations (EOAU)Division: Earth Observation - Earthquake in Haiti. Products were sent to DND and DFAIT emergency response teams for field operations in Haiti. For more information, please contact Pierre Vincent or Guy Aube.

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5. Haiti Earthquake: First Co-seismic Interferograms

TRE has proven to be the first company world-wide providing co-seismic, X-band derived interferograms of the earthquake, that hit Haiti on the 12th of January 2010. It is the result of an effective collaboration between TRE and Infoterra GmbH, which in a very short time supplied images acquired by the Terra SAR-X satellite over Haiti. The two interferograms have been created using two images acquired before the earthquake and the only one available after the earthquake. The images have a color cycle, from blue to red, corresponding to a 16 mm-displacement of earth surface as measured along the satellite's line of sight: Haiti hearthquake – First co-seismic interferograms by TRE.

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6. 3rd RADARSAT-2 Workshop

After 2 years of successful operations of RADARSAT-2, the time has come to bring together the international radar community to present the full potential of the satellite. The Canadian Space Agency (CSA) has committed to objectives that pertain to natural resource management, environmental monitoring and coastal surveillance. RADARSAT-2 data is being used by the Government of Canada to meet the current and evolving priorities of the Government, and also to foster the research and development for new applications or for improving existing ones. The third RADARSAT-2 Workshop, will take place at the Canadian Space Agency, St-Hubert, Quebec, Sept 27 - Oct 1 2010. The main objective of the Workshop is to inform all potential users of the utilizations of RADARSAT-2 data from an operational, commercial and R&D perspectives. This important event also offers an exclusive opportunity to better understand the capabilities of RADARSAT-2, to learn about application developments and have access to results from more than 225 sponsored research projects via the SOAR Program. For more information, please visit RADARSAT-2 Workshop or contact Daniel Delisle.

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7. The Pacific Islands Benefits From Canadian Earth Observation Expertise During Cyclone

On February 12 and 15, 2010, the Pacific Islands region have been hit by two tropical storms. Cyclone Pat (Category 2 on the Saffir-Simpson scale) caused widespread severe destruction across Aiutaki (Cook Islands) with 90% of homes

being damaged. Tropical Cyclone Rene (category 4) hit the northern island group of the Kingdom of Tonga. The center of the storm, the worst in 25 years, passed close to the islands of Nuku' alofa and Eua. Canadian Earth Observation (EO) satellites, such as RADARSAT-1 and RADARSAT-2, are key resources in all phases of the disaster management cycle (i.e. mitigation, preparedness, response, recovery). The International Charter Space and Major Disasters was activated by UNOOSA on behalf of UNOCHA. The International Charter aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users. Each member agency has committed resources to support the provisions of the Charter and thus is helping to mitigate the effects of disasters on human life and property. Multiple EO products were developed by the Canadian company VIASAT GeoTechnologies via a contract with the Canadian Space Agency (CSA) Earth Observation Application & Utilization Division (EOAU). To view the products, please visit: Disaster Charter - Cyclone on Pacific Islands.

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8. Canadian Oceans Observing Systems (OOS) Inventory

Observing systems are essential tools for gathering critical information about the Canadian waters, including oceans, major rivers and the Great Lakes and the links to climate change. In order to answer to the worldwide growing interest in observing systems and the widely recognized need to understand what is currently observed, the science and technology in use and the motivations behind these observations, Fisheries and Oceans Canada (DFO) and the Oceans Science and Technology Partnership (OSTP), through the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), are developing an extensive Canadian oceans observing systems (OOS) inventory. The GRIP project will catalogue each of the subsystems of existing OOS, including information on what is observed; what is observing; how data are modeled or analyzed; what data is being made available to whom and how the information is being maintained, updated, archived and managed. That inventory would give a clear knowledge of the targeted activities and help to build a national strategy. For more information, please contact Sylvain Hurtubise or Guy Aube.

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9. Precision Farming With Earth Observation: Mapping Soil Drainage Indicators

Land management factors that influence agricultural sustainability include land use, cropping patterns, and soil conservation practices. Cropping patterns can affect environmental risks, because different crops provide varying amounts and types of residue cover on soil. Over the past 15 years, the use of soil conserving practices and precision farming technologies, such as Earth Observation, on Canada's agricultural land has increased considerably. Predicting and mapping soil drainage is useful and profitable for prescribing and implementing best management practices at the watershed, farm and field levels. Through the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), Agriculture and Agri-Foods Canada (AAFC) have been working to create better opportunities for farmers and all Canadians through agricultural research and innovation using Earth Observation (EO) satellite information from RADARSAT-1 and RADARSAT-2. Through the GRIP project titled "Mapping Soil Drainage

Indicators using Earth Observation Data and New Technology" AAFC has developed Soil drainage and soil permeability classification models using EO data, maps of soil drainage and soil water regime indicators, classification of soil series into hydrologic soil groups and a soil profile geographic database of the Montérégie agricultural area. Mapping soil drainage from EO data will now be faster, more precise and less expensive for the Government of Canada than conventional soil survey procedures. This AAFC and CSA-GRIP project was developed in partnership with INRS-ETE, NRCAN-CCRS, IRDA, CCA and the MAPAQ. For more information, please contact Michel Nolin or Guy Aube.

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10. Environmental Health and Agriculture: A Geospatial Decision Support System for Spring Melt Soil Erosion Risk Management Based On RADARSAT-2

Although water quality is affected by other activities and sectors, water pollution has emerged as a major environmental and human health issue for agriculture. Surface water quality can be affected by sediment, nutrients, pesticides, and bacteria that move off agricultural land in surface run-off. Landscape soil water erosion and river banks erosion are major threat the surface water quality in Canada. Soil water erosion of agricultural land at spring melt is substantial in many areas of eastern Canada in relation with the frozen soil status, topography, soil type, land use, agricultural management and climate. Managing and mitigating both risks to non-point source water contamination and soil conservation requires identification of critical areas at the watershed scale to provide stakeholders and landowners with the spatial information needed to implement best management practices. Through the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), Agriculture and Agri-Food Canada (AAFC) are developing new methods based on RADARSAT-2 to identify agricultural land at high risk for soil water erosion at snow melt. Reliable, large-scale GIS tools will allow better determination of the soil water erosion risks to agricultural land at spring melt in eastern Canada, allowing improved location of beneficial management practices to mitigate and decrease environmental impacts. This AAFC and CSA-GRIP project was developed in partnership with the INRS-ETE and Club de Fertilisation de la Beauce, Eastern Canada Soil and Water Conservation Centre, and agricultural producers in Quebec and New-Brunswick. To view multiple products, please visit web site developed by GeoImage Solutions: Prototype - Decision Support System - GRIP. For more information, please contact Eric Vanbochove or Guy Aube. GéoImage Solutions

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11. First Images from SMOS

By regularly and consistently mapping soil moisture and ocean salinity, the SMOS (Soil Moisture and Ocean Salinity) Earth observation (EO) satellite, launched on November 2 2009, aims to improve our understanding of the role these two key variables play in regulating the water cycle. Improving the water resource management with SMOS EO data will also give the opportunity to the Government of Canada and its partners to reduce the risks of water scaricity, floods, drought, land degradation, coastal and marine ecosystems degradation, etc. To view the first calibrated images delivered by the SMOS mission, please visit ESA - Observing the Earth . To learn more about the Canadian Space

Agency (CSA) Government Related Initiatives Program (GRIP) projects related to SMOS, please visit: Earth Observation.

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12. Global Security: Bolivia Benefits From Canadian Earth Observation Information During Floods

Canada and Bolivia established diplomatic relations in 1961. Although current commercial ties are modest, bilateral relations between Canada and Bolivia are warm due to our longstanding bilateral aid programme and through strong interest and involvement on the part of Canadian civil society organizations. Canada and Bolivia also work together on security and regional issues, and at the UN and other multilateral fora. Bolivia is a CIDA Country of Focus. The bilateral aid programme in Bolivia, with a current budget of $15 million/year, is focused on securing a future for children and youth and the promotion of sustainable economic growth. On January 25 2010, heavy rains caused serious damages in communities living in bordering areas of the main rivers in lowlands and valleys, namely Cochabamba, Santa Cruz, Chuquisaca, La Paz, Potosí. According to weather forecasts by the National Meteorological Service (SENAMHI) rains will continue until March. So far, 27 deaths and 4 missing persons were reported. Canadian Earth Observation (EO) satellites, such as RADARSAT-1 and RADARSAT-2, are key resources in all phases of the disaster management cycle (i.e. mitigation, preparedness, response, recovery). Products based on RADARSAT imagery has been delivered to Bolivian regional emergency authorities to better manage the flood. To view the products, please visit: Disaster Charter - Flooding in Bolivia.

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13. Call for Proposals: Support to Young Researchers in Earth Observation

The European Space Agency (ESA) is offering young scientists the opportunity to undertake innovative research projects aimed at advancing the understanding of the Earth system, with a call for proposals for the Changing Earth Science Network initiative. This initiative, launched last year, supports European postdoctoral scientists for two years to undertake innovative research projects that address specific scientific challenges outlined in ESA's science strategy for Earth observation (EO). The deadline for the proposal submission is 29 March 2010. For more information, please visit: ESA - Observing the Earth.

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